REMARKS

Applicant hereby responds to the Office Action dated March 21, 2007. Claims 1-7 are pending and rejected, as set forth below. Claim 1 is independent. Claim 1 has been amended to correct a typographical error. Applicant respectfully submits that the claims as currently pending are in condition for allowance and respectfully requests reconsideration and further examination in view of the following.

A. Election/Restrictions under 37 CFR 1.144.

Nonelected claims 8 to 37 are cancelled without prejudice or disclaimer as required by the Examiner under 37 C.F.R. §1.144.

B. Rejections under 35 U.S.C. §103(a).

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,345,964 ("*Cooper '964*"), U.S. Patent 6,398,525 ("*Cooper '525*"), or U.S. Patent 5,203,681 ("*Cooper '681*") in view of U.S. Patent No. 5,092,821 ("*Gilbert '821*"). Applicants have reviewed the Office Action and respectfully submit that there is no *prima facie* case of obviousness, as explained below.

1. *Gilbert '821* Teaches Away from the Proposed Combination.

As a threshold issue, Applicant respectfully submits that *Gilbert '821* is not properly combined with *Cooper '964*, *Cooper '525*, or *Cooper '681* because *Gilbert '821* explicitly teaches away from the use of a threaded shaft and states: "[t]he shaft requires minimal machining, and **it completely avoids the use of threads**." The impeller-shaft connection is made by providing an opening through the center of the impeller and placing the shaft in the opening. The impeller is cemented to the end of the shaft to prevent axial separation." Col. 2, lines 18-21 (emphasis added). Not only does *Gilbert '821* expressly teach away from the use of a threaded shaft, the use of threads would interfere with cementing the shaft to the impeller, changing the principle of operation of the reference and/or rendering the invention unsatisfactory for its intended purpose. If a proposed modification would render the invention disclosed in a cited reference unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the modification. *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984); *In re Ratti*, 270 F.2d 810 (C.C.P.A. 1959); see MPEP §2143.01.V-VI. Accordingly, *Gilbert '821* is not properly combined with any of the Cooper references to establish a case of *prima facie* obviousness.

2. The Proposed Combination Would Still Lack the Limitations of the Present Invention.

However, even if *Gilbert '821* were properly combined with the *Cooper* references, none of the combinations would include each and every limitation of the claimed invention. Specifically, none of the references teaches at least (1) a keyway formed in a shaft and a projection on a coupling that is received in the keyway, or (2) a connective portion of a rotor that includes flat, shallow threads that receives a second end of a rotor shaft that also has flat, shallow threads. See claim 1 and Figs. 4, 6, 11-13.

a. The Proposed Combinations Would Lack a Projection and a Keyway.

In the Office Action, the Examiner contends that *Gilbert '821* "specifically recites the use of keys in the form of projections." Office Action, Response to Arguments Section. Applicant respectfully disagrees. *Gilbert '821* simply does not teach a coupling having a projection, nor does it teach such a projection for being received in the keyway of a shaft as does pending claim 1. Nor would it be obvious to modify *Gilbert '821* to arrive at the claimed invention. The portion of *Gilbert '821* cited by the Examiner specifically teaches that it does not use a projection as claimed herein:

> "In order to prevent relative rotational movement between the impeller 14 and the shaft 18, ***a plurality of openings 50 are formed in the impeller 14 and the shaft 18*** at the interface between the two. ***The openings 50 are aligned with the longitudinal axis of the shaft 18. Dowels 52 (FIG. 10) are inserted into the openings 50 and retained there by means of refractory cement. The dowels 52 thus function as keys.***" *Gilbert '821*, Col. 5 lines 1-8 (emphasis added).

Thus, *Gilbert '821* requires a plurality of aligned openings in the shaft and impeller and **separate pieces**, i.e., dowels, to be fitted into place during assembly. The dowels are cemented into openings in the shaft and impeller. The dowels 52 are explicitly disclosed as separate, independent pieces and are not part of shaft 18, nor is an impeller a coupling as disclosed herein. Applicant directs the Examiner to Figures 3-4 and 8-9 of the present application, which show the key and keyway. The projection is a metal piece formed in the coupling and the keyway is an elongated, axially extending groove in the shaft. With this arrangement more force can be transferred to the shaft with less of a risk of damaging it than standard coupling arrangements utilizing (1) a bore through the shaft, and (2) a bolt positioned in the bore and attached to the coupling, wherein as the coupling turns the bolt applies force to the shaft to turn it.

The suggested dowel arrangement of *Gilbert '821* would require a complete redesign of Applicant's coupling so that instead of the coupling have a projection, it would instead have a plurality of grooves to accept dowel pins. In addition to being contrary to Applicant's invention, utilizing separate dowel pins would be time consuming and expensive.

Finally, Applicant notes that there is a long-felt need for the present invention. Graphite shafts are known to be soft and to wear at pressure points, especially pressure points where the graphite directly contacts a harder material such as a steel coupling or bolt. The problem of a graphite shaft wearing at the place where it is driven by a bolt positioned in a bore through the shaft has been known for well over a decade, yet no one else has developed the solution described herein. This is further evidence the *Gilbert '821's* multiple dowels used to connect an impeller to a shaft do not render obvious Applicant's coupling or shaft, or the combination of the two.

Thus, *Gilbert '821* does not teach a second coupling member having a projection that is received in a keyway.

b. The Proposed Combinations Would Lack Flat, Shallow Threads.

Finally, none of the references include flat, shallow threads as recited in claim 1 and shown in, for example, Figs. 6, 11-13. The flat, shallow threads alleviate breakage of the threads. See Specification ¶ 41. Applicants respectfully disagree with the Examiner's characterization in the Office Action that "all of the threads of the applied references include flat portions and could all be considered "shallow" when compared to some other thread depth." Office Action, Response to Arguments Section (emphasis added). Independent claim 1 recites a second shaft end having "**flat, shallow threads**." Claim 1 does **not** recite threads that merely "include flat portions" as stated by the Examiner. Claim 1 also does **not** recite threads that are "'shallow' when compared to some other thread depth." All claim limitations are significant, and must be given weight and effect with respect to the patentability of the claim. Application of Saether, 492 F.2d 849 at 852 (C.C.P.A. 1974). If even a single claim limitation is not taught or suggested by the cited references, then that claim cannot be obvious over the cited references. Application of Glass, 472 F.2d 1388 at 1392 (C.C.P.A. 1973).

Here, the Examiner has not identified any portion of a reference that teaches or suggests a shaft having "flat threads," nor are any of the cited references seen to disclose such threads. See MPEP §706.02(j)(A). Moreover, as stated previously, the shaft in *Gilbert '821* "completely

avoids the use of threads." Col. 2, line 18. Similarly, none of the other cited references teach or suggest a shaft having "shallow threads." To the contrary, each of the threaded shafts in *Cooper '964*, *Cooper '525*, and *Cooper '681* cited by the Examiner clearly show the threads as being pointed. See Figure 1 of *Cooper '964*; Figure 13 of *Cooper '525*; and Figure 1 of *Cooper '681*. Accordingly, none of the Cooper references teach or suggest a shaft having "flat threads" or threads that could reasonably be considered "shallow."

In summary, since the limitations of claim 1 are not taught or suggested by the cited references, the references fail to support a *prima facie* case of obviousness.

CONCLUSION

In view of the amendments and arguments herein, reconsideration is respectfully requested. Applicant believes the case is in condition for allowance and respectfully requests withdrawal of the rejections and allowance of the pending claims.

Applicant reserves the right to prosecute any cancelled claims or additional claims, including claims of broader scope, in a continuation application.

Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to **Deposit Account No. 19-3878**.

The Examiner is invited to telephone the undersigned at the telephone number listed below if it would in any way advance prosecution of this case.

Respectfully submitted,

Date: 8/17/07

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